CLAIMS

1. An EL device comprising:

a first electrode,

an EL layer formed on the first electrode, and

a second electrode formed on the EL layer,

wherein at least one layer of a material whose wettability changes when light is applied thereto is formed.

2. The EL device according to claim 1, wherein the first electrode is formed on a substrate, and the layer of a material whose wettability changes when light is applied thereto is a photocatalyst-containing layer,

at least one photocatalyst-containing layer being formed at any position between the substrate and the second electrode.

3. The EL device according to claim 2, wherein the photocatalyst-containing layer has a thickness of 50 to 2000 angstroms.

4. The EL device according to claim 2, wherein the photocatalyst-containing layer is formed between the first electrode and the EL layer.

5. A full-color display comprising the EL device set forth in claim 1.

6. The EL device according to claim 1, wherein the first electrode is formed pattern-wise, the EL layer contains at least a luminous layer that is formed correspondingly to the pattern of the first electrode, and the second electrode is formed pattern-wise on the luminous layer,

the luminous layer being formed by utilizing the difference in wettability between the exposed part and the unexposed part of the layer of a material whose wettability changes when light is applied thereto.

7. The EL device according to claim 6, wherein the EL layer is composed of a plurality of luminous layers formed on the first electrode correspondingly to the pattern of the first electrode, and partitioning layers formed between the borders of the patterned luminous layers,

at least one of the luminous layers and partitioning layers being formed by utilizing the difference in wettability between

the exposed part and the unexposed part of the layer of a material whose wettability changes when light is applied thereto.

8. The EL device according to claim 6, wherein the luminous layer is formed on the electrode through at least one of a buffer layer and a charge-transfer layer.

9. The EL device according to claim 6, wherein the exposed part of the layer of a material whose wettability changes when light is applied thereto is highly hydrophilic, and the unexposed part of the same is water-repellent.

10. The EL device according to claim 6, wherein the layer of a material whose wettability changes when light is applied thereto is a photocatalyst-containing layer that contains at least a photocatalyst and a binder.

11. The EL device according to claim 10, wherein the photocatalyst contained in the photocatalyst-containing layer is titanium dioxide.

12. The EL device according to claim 10, wherein the binder contained in the photocatalyst-containing layer is an organopolysiloxane obtained by hydrolyzing and polycondensing chlorosilane or an alkoxysilane.

13. The EL device according to claim 10, wherein the binder contained in the photocatalyst-containing layer is an organopolysiloxane obtained by crosslinking a reactive silicone.

14. The EL device according to claim 1, wherein the layer of a material whose wettability changes when light is applied thereto comprises a polymeric organic resin.

15. The EL device according to claim 1, wherein the layer of a material whose wettability changes when light is applied thereto is a photocatalyst-containing layer, and the EL device can display, by the emission of light, a pattern that is different from either the pattern of the first electrode or that of the second electrode.

16. The EL device according to claim 15, comprising at least one patterned buffer layer, charge-injection layer, charge-transfer layer or luminous layer on the photocatalyst-containing layer, capable of displaying, by the emission of light, a pattern corresponding to the pattern of the

buffer, charge-injection, charge-transfer or luminous layer.

17. The EL device according to claim 15, in which either the first electrode or the second electrode is anode,

which comprises the photocatalyst-containing layer formed on the anode, a patterned hole-injection layer formed on the photocatalyst-containing layer, and a luminous layer formed on the hole-injection layer, and

which can display, by the emission of light, a pattern corresponding to the pattern of the hole-injection layer.

18. The EL device according to claim 15, comprising at least one patterned insulating layer on the photocatalyst-containing layer, capable of displaying, by the emission of light, a pattern corresponding to the part where the insulating layer does not exist.

19. The EL device according to claim 18, wherein the insulating layer is made from an ultraviolet-curing resin.

20. The EL device according to claim 1, wherein the first electrode is formed on a substrate, and the layer of a material whose wettability changes when light is applied thereto is a photocatalyst-containing layer,

at least one photocatalyst-containing layer being formed at any position between the substrate and the second electrode,

the photocatalyst-containing layer containing a substance capable of improving light emission properties.

21. The EL device according to claim 20, wherein at least one insulating layer is partially formed on the photocatalyst-containing layer.

22. The EL device according to claim 21, wherein at least one insulating layer made from a photosetting or thermosetting resin is partially formed on the photocatalyst-containing layer to make a part of the photocatalyst-containing layer on which the insulating layer is formed non-luminous.

23. The EL device according to claim 20, wherein the substance capable of improving light emission properties comprises a metal salt.

24. A process for producing an EL device which comprises a layer of a material whose wettability changes when light is

applied thereto, a first electrode formed on the layer of a material whose wettability changes when light is applied thereto, an EL layer formed on the first electrode, and a second electrode formed on the EL layer, comprising the steps of

applying light pattern-wise to the layer of a material whose wettability changes when light is applied thereto, thereby forming on the layer a latent pattern due to the difference in wettability,

applying a first-electrode-forming coating liquid to the exposed part of the layer of a material whose wettability changes when light is applied thereto, thereby forming pattern-wise the first electrode,

forming the EL layer on the patterned first electrode, and

forming the second electrode on the EL layer.

25. A process for producing an EL device which comprises a first electrode, a layer of a material whose wettability changes when light is applied thereto formed on the first electrode, an EL layer formed on the layer of a material whose wettability changes when light is applied thereto, and a second electrode formed on the EL layer, comprising the steps of

forming, on the first electrode, the layer of a material whose wettability changes when light is applied thereto,

applying light pattern-wise to the layer of a material whose wettability changes when light is applied thereto, thereby forming on the layer a latent pattern due to the difference in wettability,

applying an EL-layer-forming coating liquid to the exposed part of the layer of a material whose wettability changes when light is applied thereto, thereby forming pattern-wise the EL layer, and

forming the second electrode on the patterned EL layer.

26. A process for producing an EL device which comprises a first electrode, an EL layer formed on the first electrode, a layer of a material whose wettability changes when light is applied thereto formed on the EL layer, and a second electrode formed on the layer of a material whose wettability changes when light is applied thereto, comprising the steps of

forming the EL layer on the first electrode,

forming, on the EL layer, the layer of a material whose wettability changes when light is applied thereto,

applying light pattern-wise to the layer of a material whose wettability changes when light is applied, thereby forming on the layer a latent pattern due to the difference in wettability, and

applying a second-electrode-forming coating liquid to the exposed part of the layer of a material whose wettability changes when light is applied thereto, thereby forming pattern-wise the second electrode.

27. A process for producing an EL device which comprises a first electrode, a first EL layer formed on the first electrode, a layer of a material whose wettability changes when light is applied thereto formed on the first EL layer, a second EL layer formed on the layer of a material whose wettability changes when light is applied thereto, and a second electrode formed on the second EL layer, comprising the steps of

forming the first EL layer on the first electrode,

forming, on the first EL layer, the layer of a material whose wettability changes when light is applied thereto,

applying light pattern-wise to the layer of a material whose wettability changes when light is applied thereto, thereby forming on the layer a latent pattern due to the difference in wettability,

applying a second-EL-layer-forming coating liquid to the exposed part of the layer of a material whose wettability changes when light is applied thereto, thereby forming pattern-wise the second EL layer, and

forming the second electrode on the patterned second EL layer.

28. A process for producing an EL device which comprises a first electrode, a layer of a material whose wettability changes when light is applied thereto formed on the first electrode, an EL layer formed on the layer of a material whose wettability changes when light is applied thereto, and a second electrode formed on the EL layer, comprising the steps of

forming, on the first electrode, the layer of a material whose wettability changes when light is applied thereto,

applying light pattern-wise to the layer of a material whose wettability changes when light is applied thereto, thereby forming on the layer a latent pattern due to the difference in wettability,

applying an insulating-layer-forming coating liquid to the exposed part of the layer of a material whose wettability changes when light is applied thereto, thereby forming pattern-wise the insulating layer,

applying an EL-layer-forming coating liquid to the layer of a material whose wettability changes when light is applied thereto, on which the insulating layer has been formed, and

forming the second electrode on the EL layer.

29. A process for producing an EL device which comprises a first electrode, a layer of a material whose wettability changes when light is applied thereto formed on the first electrode, a partitioning layer and a luminous layer formed on the layer of a material whose wettability changes when light is applied thereto, and a second electrode formed on the luminous layer, comprising the steps of

laminating, to the patterned first electrode, the layer of a material whose wettability changes when light is applied thereto,

applying light only to a part of the layer of a material whose wettability changes when light is applied thereto that corresponds to the part between the borders of the patterned first electrode, through a mask having the negative pattern of the pattern of the first electrode,

laminating the partitioning layer to the exposed part of the layer of a material whose wettability changes when light is applied thereto that corresponds to the part between the borders of the patterned first electrode, by utilizing the difference in wettability between the exposed part and the unexposed part of the layer of a material whose wettability changes when light is applied thereto,

laminating the luminous layer between the borders of the

patterned partitioning layer after applying light to the entire surface of the above semi-finished product, and

laminating pattern-wise the second electrode to the luminous layer and the partitioning layer.

30. A process for producing an EL device which comprises a layer of a material whose wettability changes when light is applied thereto, a first electrode and a partitioning layer formed on the layer of a material whose wettability changes when light is applied thereto, a luminous layer formed on the first electrode, and a second electrode formed on the luminous layer and the partitioning layer, comprising the steps of

forming pattern-wise the first electrode on the layer of a material whose wettability changes when light is applied thereto,

laminating the luminous layer to the patterned first electrode by utilizing the difference in wettability between the layer of a material whose wettability changes when light is applied thereto and the patterned first electrode,

applying light to a part of the layer of a material whose wettability changes when light is applied thereto that corresponds to the part between the borders of the patterned first electrode,

laminating the partitioning layer to the exposed part of the layer of a material whose wettability changes when light is applied thereto, and

laminating pattern-wise the second electrode to the luminous layer and the partitioning layer.

31. The process for producing the EL device according to claim 24 or 30, comprising the step of forming, in advance on a substrate, the layer of a material whose wettability changes when light is applied thereto.

32. The process for producing the EL device according to any of claims 25 to 29, comprising the step of forming, in advance, the first electrode on a substrate.

33. The process for producing the EL device according to any of claims 24 to 30, wherein the layer of a material whose wettability changes when light is applied thereto is a

photocatalyst-containing layer.

34. The process for producing the EL device according to claim 24, wherein the first-electrode-forming coating liquid contains a polar solvent, and the application of this coating liquid is conducted by a method selected from spin coating, ink-jetting, dip coating, blade coating, printing, dispensing, and dropping of the coating liquid on the photocatalyst-containing layer.

35. The process for producing the EL device according to claim 25, wherein the application of the EL-layer-forming coating liquid is conducted by a method selected from spin coating, ink-jetting, dip coating, blade coating, printing, dispensing, and dropping of the coating liquid on the photocatalyst-containing layer.

36. The process for producing the EL device according to claim 26, wherein the second-electrode-forming coating liquid contains a polar solvent, and the application of this coating liquid is conducted by a method selected from spin coating, ink-jetting, dip coating, blade coating, printing, dispensing, and dropping of the coating liquid on the photocatalyst-containing layer.

37. The process for producing the EL device according to claim 24, wherein the patterning of the first electrode that is conducted after the first-electrode-forming coating liquid is applied is effected by a method selected from a method in which the layer of a material whose wettability changes when light is applied thereto is inclined before the first-electrode-forming coating liquid applied is solidified, a method in which air is blown, and a method in which an adhesive tape is adhered to the solidified first-electrode-forming coating liquid and then peeled off.

38. The process for producing the EL device according to claim 25, wherein the patterning of the EL layer that is conducted after the EL-layer-forming coating liquid is applied is effected by a method selected from a method in which the layer of a material whose wettability changes when light is applied thereto is inclined before the EL-layer-forming coating liquid applied is

solidified, a method in which air is blown, and a method in which an adhesive tape is adhered to the solidified EL-layer-forming coating liquid and then peeled off.

39. The process for producing the EL device according to claim 26, wherein the patterning of the second electrode that is conducted after the second-electrode-forming coating liquid is applied is effected by a method selected from a method in which the layer of a material whose wettability changes when light is applied thereto is inclined before the second-electrode-forming coating liquid applied is solidified, a method in which air is blown, and a method in which an adhesive tape is adhered to the solidified second-electrode-forming coating liquid and then peeled off.

40. The process for producing the EL device according to claim 27, wherein the patterning of the EL layer that is conducted after the second-EL-layer-forming coating liquid is applied is effected by a method selected from a method in which the layer of a material whose wettability changes when light is applied thereto is inclined before the second-EL-layer-forming coating liquid applied is solidified, a method in which air is blown, and a method in which an adhesive tape is adhered to the solidified second-EL-layer-forming coating liquid and then peeled off.

41. The process for producing the EL device according to any of claims 24 to 27, wherein at least one of the first electrode, the second electrode and the EL layer is formed by vacuum deposition, and the patterning of the vacuum-deposited layer is conducted by adhering thereto an adhesive tape, followed by peeling.

42. The process for producing the EL device according to claim 33, wherein the unexposed part of the photocatalyst-containing layer is water- and/or oil-repellent, and the exposed part of the same has increased wettability.

43. The process for producing the EL device according to claim 25 or 27, wherein the EL device is a full-color display, and picture elements on the display correspond to the latent pattern due to the difference in the wettability formed on the photocatalyst-containing layer.

44. The process for producing the EL device according to claim 25 or 27, wherein the first and second electrodes are formed pattern-wise, the EL layer is a luminous layer, and the application of light is conducted correspondingly to the pattern of the first electrode.

45. The process for producing the EL device according to any of claims 25, 27, 29 and 30, wherein the luminous layer is laminated through at least one of a buffer layer and a charge-transfer layer.

46. The process for producing the EL device according to any of claims 25, 27, 29 and 30, wherein the lamination of the luminous layer or the partitioning layer is effected by a method selected from ink-jetting, uniform coating, and pattern-printing.

47. The process for producing the EL device according to any of claims 25, 27, 29 and 30, wherein the lamination of the luminous layer or the partitioning layer is effected by vacuum deposition, and the film deposited on the unexposed part of the wettability-changeable material layer is stripped.

48. The process for producing the EL device according to claim 28, wherein the insulating layer is made from an ultraviolet-curing resin.

49. The process for producing the EL device according to any of claims 24 to 27, wherein the photocatalyst-containing layer contains a substance capable of improving light emission properties.